Measurements, Accuracy, and Sig Figs.

Introduction:

In laboratory experiments your ability to use equipment and carefully measure is a key to success. In this exercise today we’ll practice using some common laboratory equipment and measuring a variety of substances. We’ll also practice using significant figures in our measurements and calculations. Remember that all measurements have certain and uncertain figures. Measurements are only as good as the measuring equipment and the person making the measurement. Make sure that your measurements are done carefully and that they only contain one “uncertain” figure.

Equipment:

250mL and 400mL Beakers

10mL and 100mL Graduated Cylinders

Balance

20 cm Ruler

10 and 1mL pipettes

Materials:

Water

Oil

Cube

Rock

Pebble

Sand

3—Cardboard Rectangles and 1—Cardboard Irregular Shapes

Procedure: Use the equipment to complete all the measurements on the data table. Be sure to use units for all. Then make the necessary calculations. How will you be able to determine the area of the cardboard shape? Do you think that you will be able to decide what the density of the shape is?

**Table 1:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Material | Volume in beaker | Volume in graduated cylinder | Mass | Density |
| Water |  |  |  |  |
| Oil |  |  |  |  |
| Pebble |  |  |  |  |
| Sand |  |  |  |  |

**Table 2:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Material | Length | Width | Area | Mass | Volume | Density |
| A |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
| C |  |  |  |  |  |  |
| Shape | XXXXXX | XXXXXXX |  |  | XXXXXX |  |

Compare your measurements with two or three other groups. Are you measurements similar to theirs? Should they be? What could be the cause of any differences? What can you do to make sure that your measurements are as accurate as possible?